

Appl. No. 09/964,364
Art Unit 1764
December 4, 2003
Reply to Office Action of July 8, 2003

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

1. (Currently Amended) A process of ~~separating/purifying~~
separating or purifying 1,1,1,3,3-pentafluoropropane in which a mixture comprising at least 1,1,1,3,3-pentafluoropropane and hydrogen fluoride is subjected to a distillation step so that a distillate is obtained which comprises an azeotropic mixture consisting essentially of 1,1,1,3,3-pentafluoropropane and hydrogen fluoride, wherein under a pressure in a range of 2.95 kg/cm²-gauge to 9.60 kg/cm²-gauge, the azeotropic mixture has a temperature of 40°C to 80°C; and a bottom product is obtained which comprises 1,1,1,3,3-pentafluoropropane substantially free from hydrogen fluoride.

2. (Currently Amended) A process of ~~separating/purifying~~
separating or purifying hydrogen fluoride in which a mixture comprising at least 1,1,1,3,3-pentafluoropropane and hydrogen fluoride is subjected to a distillation step so that a distillate is obtained which comprises an azeotropic mixture consisting essentially of 1,1,1,3,3-pentafluoropropane and hydrogen fluoride, wherein under a pressure in a range of 2.95 kg/cm²-gauge to 9.60 kg/cm²-gauge, the

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azeotropic mixture has a temperature of 40°C to 80°C, and a bottom product is obtained which comprises hydrogen fluoride substantially free from 1,1,1,3,3-pentafluoropropane.

3. (Currently Amended) A process of treating a feed mixture comprising at least 1,1,1,3,3-pentafluoropropane and hydrogen fluoride, which process comprises the steps of:

subjecting the feed mixture to a first distillation stage, whereby

a first distillate is obtained which comprises an azeotropic mixture consisting essentially of 1,1,1,3,3-pentafluoropropane and hydrogen fluoride, wherein under a pressure in a range of 2.95 kg/cm²-gauge to 9.60 kg/cm²-gauge, the azeotropic mixture of the first distillate has a temperature of 40°C to 80°C, and

a first bottom product is obtained which comprises 1,1,1,3,3-pentafluoropropane substantially free from hydrogen fluoride when a 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is larger than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate, or a first bottom product is obtained which comprises hydrogen fluoride substantially free from 1,1,1,3,3-pentafluoropropane when the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is

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smaller than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate, and

subjecting the first distillate to a second distillation stage which is operated at a pressure which is different from that of the first distillation stage, whereby

a second distillate is obtained which comprises an azeotropic mixture consisting essentially of 1,1,1,3,3-pentafluoropropane and hydrogen fluoride, wherein under a pressure in a range of 2.95 kg/cm²-gauge to 9.60 kg/cm²-gauge, the azeotropic mixture of the second distillate has a temperature of 40°C to 80°C, and

a second bottom product is obtained which comprises 1,1,1,3,3-pentafluoropropane substantially free from hydrogen fluoride when the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is larger than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, or a second bottom product is obtained which comprises hydrogen fluoride substantially free from 1,1,1,3,3-pentafluoropropane when the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is smaller than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

4. (Currently Amended) The process according to claim 3, wherein the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the feed

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mixture is larger than the 1,1,1,3,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and also larger than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, and the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is smaller than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

5. **(Currently Amended)** The process according to claim 3, wherein the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is smaller than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and also smaller than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, and the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is larger than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

6. **(Currently Amended)** The process according to claim 3, wherein the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is between the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and the R-1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, and the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the

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first distillate is larger than the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

7. (**Currently Amended**) The process according to claim 3, wherein the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the feed mixture is between the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate and the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate, and the 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the first distillate is smaller than the ~~R-245fa/HF~~ 1,1,1,3,3-pentafluoropropane/hydrogen fluoride ratio of the second distillate.

8. (**Currently Amended**) The process according to claim 4, wherein the first distillation stage is operated at a pressure in the range between 1 kg/cm²-G and 4 kg/cm²-G or in the range between 8 kg/cm²-G and 20 kg/cm²-G, and the second distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G.

9. (**Currently Amended**) The process according to claim 5, wherein the first distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G, and the second distillation stage is operated at a pressure in the range between 1 kg/cm²-G and 4 kg/cm²-G or in the range between 8 kg/cm²-G and 20 kg/cm²-G.

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10. (Currently Amended) The process according to claim 6, wherein the first distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G, and the second distillation stage is operated at a pressure in the range between 1 kg/cm²-G and 4 kg/cm²-G or in the range between 8 kg/cm²-G and 20 kg/cm²-G.

11. (Currently Amended) The process according to claim 7, the first distillation stage is operated at a pressure in the range between 1 kg/cm²-G and 4 kg/cm²-G or in the range between 8 kg/cm²-G and 20 kg/cm²-G, and the second distillation stage is operated at a pressure in the range between 4 kg/cm²-G and 8 kg/cm²-G.

12. (Canceled)